

Claims

1. A motor vehicle identity anti-fake apparatus, comprising a communicator (2-1) for performing radio frequency communication with a roadside detection station, characterized in that it further comprises member anti-fake means (3), a microcomputer (1) and information displays (4); wherein

each of said member anti-fake means (3) is a memory (301) for storing cipher data and authentication logic, license plate of a vehicle and respective members of the vehicle which is legally enrolled and registered each is provided with at least one of the member anti-fake means (3); a data input/output interface (302) of each of said member anti-fake means (3) is connected to a communication interface (13) of said microcomputer (1) via wires;

each of said information display (4) is mounted on a proper position of said vehicle and takes the form of an electronic information displaying means; each of said information display is respectively connected to said communication interface (13) of said microcomputer (1) via wires, and converts information which reflects legal status of said vehicle identity stored in said microcomputer (1) into information in a form which can be identified by sense of a person, under control of said microcomputer (1);

said microcomputer (1) is mounted on a proper position of said vehicle, and comprises a microprocessor (11), said memory (12) and a set of said communication interfaces (13); said communicator (2-1) is provided with a communication interface which is connected to said communication interface

(13-6) of said microcomputer (1) via wires; a vehicle-mount information system centering on said microcomputer (1) for monitoring, reflecting legal status of said vehicle identity is formed by signal connection of said microcomputer (1) and each of said member anti-fake means(3), information displays (4) and communicators (2).

2. The motor vehicle identity anti-fake apparatus according to claim 1, characterized in that each of said member anti-fake means (3) is fixed on said license plate and each legally enrolled and registered member of said vehicle in a manner of sticking and covering seal.

3. The motor vehicle identity anti-fake apparatus according to claim 1, characterized in that each of said member anti-fake means (3) employs a chip and antenna of a noncontact IC card, and is in signal connection with said microcomputer (1) through a noncontact IC card read/write unit, wherein said noncontact IC card read/write unit is in signal connection with said chip and antenna of said noncontact IC card in a radio frequency communication manner, a communication interface of said noncontact IC card read/write unit is connected to said communication interface (13) of said microcomputer (1) by wires; said noncontact IC card read/write unit is mounted within a valid range for communication with said antenna of said noncontact IC card; each of said member anti-fake means (3) can also be read by an external legal read/write unit while employing said chip and antenna of said noncontact IC

card.

4. The motor vehicle identity anti-fake apparatus according to claim 1, characterized in that said information displays (4) employ electroluminescence colorful light information displays (41) and are mounted on a position where color light signal can be directly and intuitively observed by a person outside said vehicle; wiring ports of said information displays (4) are connected to corresponding communication interfaces (13) of said microcomputer (1) via wires; under control of said microcomputer (1), said information displays (4) represent specific information of legal status of said vehicle identity by using different position relation, color or flicker frequency of the light.

5. The motor vehicle identity anti-fake apparatus according to claim 1, characterized in that said information display (4) employs an electrically sounding acoustic information display (42) which is mounted on a position where acoustic signal can be clearly heard by a person outside said vehicle; a wiring port of said electrically sounding information display (4) is connected to corresponding communication interface (13-8) of said microcomputer (1) via wires; under control of said microcomputer (1), said information display (4) represents that there currently exists a legal status of said vehicle identity by using acoustic signals.

6. The motor vehicle identity anti-fake apparatus according to claim 1, characterized in that said information display (4) employs a screen display (43); a communication interface of said information display (4) is connected to corresponding communication interface (13-7) of said microcomputer (1) via wires; under control of said microcomputer (1), said information display (4) represents a present information of vehicle identity status by using graphics and text.
7. The motor vehicle identity anti-fake apparatus according to claim 1, characterized in that it may further comprise a wireless remote communicator (2-2) having a communication interface which is connected to said communication interface (13-5) of said microcomputer (1) via wires.
8. The motor vehicle identity anti-fake apparatus according to claim 1, 3, 4, 5 or 7, characterized in that said member anti-fake means (3), microcomputer (1), colorful light information displays (41), acoustic information display (42) and communicator (2) are mounted and packaged within a license plate body (7), which body serves as a base and a casing of these components; said license plate body (7) employs insulating material, and sets windows on its front face for radiating color light signal outward by said colorful light information displays (41).
9. The motor vehicle identity anti-fake apparatus according to claim 1, 4, 5,

6 or 7, characterized in that said microcomputer (1), information displays (4) and communicators (2) are packaged within a cartridge being mounted on a position in front of a driver inside said vehicle where the cartridge can be directly observed from outside.

10. The motor vehicle identity anti-fake apparatus according to claim 4 or 5, characterized in that said colorful light information displays (41) and acoustic information display (42) are respectively connected to said microcomputer (1) through respective acoustooptic controllers (5), wherein a communication interface of each of said acoustooptic controllers (5) is respectively connected to said communication interface (13) of said microcomputer (1) via wires; an output port (503) of each of said acoustooptic controllers (5) is directly jointed to a wiring port of said colorful light information displays (41) or acoustic information display (42), and said connection port and said acoustooptic controllers (5) are packaged and sealed into an closed whole body by insulating material; and wherein

each of said acoustooptic controllers (5) is a microcomputer system having an acoustooptic drive module (502), comprising CPU, ROM, RAM, I/O, a communication interface (501), an acoustooptic drive module (502) and said output port (503).

11. A method for judging legality of identity of a vehicle by using the motor vehicle identity anti-fake apparatus according to claim 1, characterized in that

said method comprises steps:

① judging legality of license plate and main members of the present vehicle, wherein:

each member anti-fake means (3) is respectively integrated with each of said license plates and legally enrolled and registered members of said vehicle to form a whole body, the microcomputer (1) uses each of said member anti-fake means and features of information stored in the microcomputer as feature signs for identifying identity of each of said license plates or legally enrolled and registered members of said vehicle; the memory (12) of the microcomputer (1) stores feature information of respective member anti-fake means and the part represented by the anti-fake means; when judging the legality of respective license plates or legally enrolled and registered members of said vehicle, said microcomputer (1) first extracts the information of said member anti-fake means (3) and enters it into said memory (12) of the microcomputer (1); then compares it with said previously stored feature information of respective member anti-fake means (3); if the comparison result is consistent, it indicates that the identity of the license plate or member as represented by said member anti-fake means is legal, if the comparison result is inconsistent or the feature information of some member anti-fake means does not exist, it means that the identity of corresponding license plate or member is illegal;

② judging whether the present vehicle has passed the verification and check with respect to stipulated items on schedule, wherein:

said microcomputer (1) retrieves time when related items passed the verification and check at the latest time and the period of validity of the items from vehicle archive information stored in said memory (12) of the microcomputer (1), and compares said period of validity with the present date of inner clock of the microcomputer; if the present date falls within the period of validity, it means that the vehicle has passed the verification and check with respect to stipulated items on schedule; otherwise, it means that the vehicle has not passed the verification and check with respect to stipulated items on schedule;

③judging whether the present vehicle has some special usage or not, wherein:

said microcomputer (1) retrieves and judges information on usage and period of validity thereof from the vehicle archive information stored in said memory (12), and if there exists some special usage and the present date falls within the period of validity, it means that the vehicle has a certain type of special usage; otherwise, no certain type of special usage exists;

④ judging to determine whether the present vehicle belongs to the motor vehicle particularly tracked by related enforcement organ, wherein:

the enforcement organ presets in said microcomputer (1) a calling cipher for the vehicle identity anti-fake apparatus of the particularly tracked vehicle; if the communicator (2) receives the calling cipher for the vehicle identity anti-fake apparatus of the particularly tracked vehicle, said microcomputer (1) compares the calling cipher with the calling cipher of the particularly tracked

vehicle stored in its memory; if the comparison result is confirmative, it means that the present vehicle belongs to the motor vehicle particularly tracked by the related enforcement organ;

⑤judging whether the appearance color, pattern, configuration and size of the present vehicle are in conformity with those of in the enrollment and registration:

said microcomputer (1) stores real-time image or feature information of the present vehicle, which is transmitted from external detection station and received by said communicator (2), in said memory (12); said microcomputer (1) compares the received information with the image feature of the present vehicle in the vehicle archive information stored in said memory (12); if the comparison result is consistent, it means that the related items of the present vehicle are in conformity with those of in the enrollment and registration; otherwise, it means that these two are in no conformity.

12. The method according to claim 11, characterized in that the method for the motor vehicle identity anti-fake apparatus to transmit outward information which reflects legality status of the present vehicle identity comprises the following steps:

① a receiver (2) of respective communicator (2) of the motor vehicle identity anti-fake apparatus keeping being in a operation state under control of said microcomputer (1);

② after finding that said communicator (2) receive legal calling

information from the management center or detection station, said microcomputer (1) storing said set of information into said memory (12);

③ said microcomputer (1) judging the newly-stored information and checking whether there exists a detection command or questioning query information in the newly-stored information;

④ if there exists, said microcomputer further judging identity authority of the person who detects or questions and queries;

⑤ based on the authority of the person who detects or questions and queries, a microprocessor (11) of said microcomputer (1) selecting necessary information according to predetermined program from information stored in the memory (12), which information includes operation records of conclusion and procedure of the monitoring made by the motor vehicle identity anti-fake apparatus on current legality status of the present vehicle identity, the vehicle archive information, records of the detection of the present vehicle made by the management center and the detection station on query items, procedure and time, and processing and generating reply information and controlling a transmitter of said communicator (2) to transmit the reply information.